

Summary

The purpose of this document is to present the site-specific end state cleanup vision for the U.S. Department of Energy's (DOE) Hanford Site. This document responds to the requirements of DOE Policy 455.1, *Use of Risk-Based End States*, and was prepared following DOE's *Guidance for Developing a Site-Specific Risk-Based End State Vision*. The purpose of the policy is to focus DOE on conducting cleanup that protects human health and the environment for the planned future use of each defined area on the Hanford Site. In addition, the policy directs the consideration of future land use and risk in making cleanup decisions. The policy requires DOE to continue to comply with applicable federal, state, community and treaty requirements. It is not a license to do less, but rather to link decision making to a larger perspective.

Hanford's regulatory agencies, the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology), along with many other Hanford stakeholders were not in agreement with pursuing the DOE's Risk-Based End State Vision initiative. They pointed out that risk is only one of the nine criteria in the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) process and that focusing the decision solely on risk is unacceptable. However, they recognized that a more detailed end state definition is needed in the near-term to better focus remediation decisions and support the many key decisions that need to be made in the next several years. The Tri-Party agencies (DOE, EPA, and Ecology) along with several Hanford Advisory Board members formed a Hanford End States Interagency Management Integration Team (IAMIT) with the intent of building on the principles and outcomes of earlier public processes as well as adding detail and clarity for cleanup. This was a collaborative process requiring major participation and involvement from this team. Workshops planned by this IAMIT were held during June and August 2004 and May 2005 to obtain this input. Workshop participants, including regulatory agencies, stakeholders, Tribes and the public indicated the workshops were very informative and provided an opportunity for meaningful input to the Hanford cleanup decision process.

The DOE offices in Richland found the workshops valuable for obtaining input from the regulatory agencies, the public, stakeholders, and Tribal Nations on potential future uses of the Hanford Site and key cleanup strategies. This information will help DOE refine their vision of future land uses and develop sustainable cleanup decisions for Hanford. In addition, this clearer vision of Hanford's end states will enable DOE to write meaningful statements of work for the next generation of Central Plateau contracts and to reduce uncertainties and performance risks as those contracts are implemented.

The Hanford Site End State Vision describes a post-cleanup condition for the Hanford Site. The end state described in this document was originally based on an established land-use plan contained in the *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement* (CLUP; DOE 1999a). DOE recognizes that this document covers a 50-year planning window and that the contaminants that will remain at Hanford after cleanup will be hazardous for much longer periods of time. This led DOE to recognize that a broader set of potential future uses must be considered as cleanup decisions are finalized if those decisions are to be sustainable. Following the workshops, sections were added to the document describing the modified vision based on the workshop input.

This document provides a regional context for the end state vision and describes the hazards that must be mitigated as DOE moves toward an end state for the Hanford Site. Wherever possible, this document draws on existing documents and agreements already in place. A number of potential alternatives were considered during the creation of this document. DOE revised their original end state alternatives based on feedback from the end states workshops and follow-on consultation with the Tribes. DOE's stakeholders do not uniformly support each of these alternatives. Chapter 5 provides a description of the alternatives, and recommendations to support them, that exist between the end state vision and current cleanup plans.

The alternatives serve to identify tasks that DOE believes should be implemented in pursuit of the end state vision. These are tasks that DOE believes will help better quantify impact and address barriers and will also help focus ongoing planning and regulatory and community consultation on decision making tied to anticipated future land uses. Input received via the workshops will be considered in future CERCLA cleanup decisions. In addition, any alternatives that are pursued by DOE will be done through the existing decision-making processes that involve regulatory agencies, stakeholders, and Tribal Nations, as appropriate. The following are the revised end state vision alternatives:

1. Cleanup of the 100 Areas based on conservation and preservation land-use exposure scenarios for recreational, resident park ranger and tribal activities, including fishing for the next 50 years. Beyond 50 years unlimited use is anticipated.
 - Continue remediation of waste sites to the current Interim Action Record of Decisions (RODs).
 - No further degradation of groundwater above drinking water standards and restore groundwater to beneficial drinking water use when practicable. Follow process outlined in state and federal regulations to establish protective limits when applicable or relevant and appropriate requirements (ARARS) cannot be met.
 - Expedite final risk assessments and final RODs. Develop pathway analysis and exposure factors for the 100 Areas land-use scenarios identified in CLUP. In addition, analyze multiple scenarios considering input from the 100 Area End State Workshop.
2. Waste sites in the 300 Area should be cleaned up to achieve remedial action objectives that are based on industrial land-use exposure scenarios already identified in the CLUP.
 - Continue remediation of waste sites to industrial standards as required under the current Interim Action RODs. Remediated sites will be backfilled to support unlimited surface use (irrigation and groundwater use may be restricted, based on success of future groundwater cleanup activities) where practicable.
 - Re-evaluate the natural attenuation decision for the uranium plume at the 300 Area and develop a proposed plan/focused feasibility study to determine if other more effective groundwater remedial alternatives are available to meet cleanup goals. Work to meet the goals of no further degradation of groundwater above drinking water standards and restore groundwater to beneficial drinking water use when practicable. Follow process outlined in state and federal regulations to establish protective clean up goals if groundwater cannot be restored in a reasonable time frame.

3. A Central Plateau Core Zone will be a permanent waste management area and will remain under federal control for the next 150 years or longer. A buffer area (outside a Core Zone) will be maintained between a Core Zone and the remainder of the Central Plateau during cleanup operations. After cleanup is complete the buffer area will shrink and land use will be similar to the 100 Area. From the buffer area to the Columbia River, cleanup will be consistent with the 100 Area.
 - Address waste sites in a Core Zone through the CERCLA process consistent with *industrial exclusive and conservation/preservation land-use scenarios* identified in the CLUP and within the timeframe identified in the CLUP ROD (at least 50 years).
 - Remediate and monitor waste sites to achieve human health and environmental protection goals under CERCLA.
 - Remove and consolidate small waste sites to optimize placement and minimize the number of surface barriers.
 - Manage groundwater contamination across the site in accordance with the February 2004 *Hanford Site Groundwater Strategy* (DOE 2004a).
 - Retrievably stored suspect TRU waste will be retrieved, treated, and the TRU portion shipped to the Waste Isolation Pilot Plant (WIPP). The low-level portion of the retrieved waste will be treated and disposed of on-site. Wastes containing transuranic materials buried pre-1970 will be managed per CERCLA decisions.
4. Stabilize high-radioactivity material in a 200 Area Core Zone and allow for radioactive decay prior to final disposition.
 - Continue storage of cesium and strontium capsules in wet storage in the Waste Encapsulation and Storage Facility in the 200 Area in the near term (up to 5 years). Place cesium and strontium capsules in dry storage in the 200 Area until the cesium capsules can be sent to a geological repository and strontium capsules can be disposed of in the Central Plateau in accordance with waste acceptance criteria and CERCLA decision documents. There are regulatory issues and Ecology has serious concerns with this on-site disposal alternative.
 - Stabilize K-Basin sludge and dispose at WIPP or in a 200 Area Core Zone (if less than 100 nCi/g) in accordance with waste acceptance criteria and CERCLA decision documents. Grout remaining equipment and material in place and then cut up and move to a disposal facility in the 200 Area.
5. Remove-treat-dispose or stabilize in place contaminated materials within a Central Plateau Core Zone utilizing the CERCLA process.
 - Use canyon facilities that are robust as engineered waste disposal facilities.
 - Dispose small waste sites within or near the canyon/Plutonium Finishing Plant (PFP) facilities to optimize barriers and/or cap sizes.

- Grout in place the contaminated equipment in Plutonium-Uranium Extraction (PUREX) Plant tunnels.¹
 - Disposition buried pipelines in place in the Central Plateau using the Resource Conservation and Recovery Act (RCRA) and CERCLA processes, by remove-treat-dispose, or stabilize in place.¹
 - Demolish PFP to slab-on-grade. Remove equipment, debris, and plutonium hold-up material from PFP and dispose at WIPP or onsite in accordance with waste acceptance criteria and CERCLA decision documents.
6. Tank waste should be retrieved and the tank farms closed based on regulatory requirements (RCRA and CERCLA) and considering risk.
- Complete the tank closure environmental impact statement expeditiously with a ROD that allows the closure permitting process to begin.
7. The reactor pipelines in the Columbia River and the reactor cores revised end states are as follows:
- Cocoon eight of nine reactors and leave in place to decay for up to 75 years. DOE will make a final decision on whether to cut up and move reactor cores to Central Plateau after sufficient decay has occurred. The decision will be made prior to cleanup completion. This delay will require a commitment of future funds toward the final decision.
 - Keep the B Reactor in its current configuration until funding is secured to support a museum. Should the support not materialize, B Reactor will follow the path described for the other reactors. Cocooning of B Reactor would be finished with the remainder of the 100 Area cleanup completions and no later than the end of the River Corridor Contract period.
 - Leave the reactor pipelines in the Columbia River if risk levels are protective and ARARs are complied with and removal results in additional impact. Stabilize the pipelines if required. This evaluation will be part of the final ROD (2008) via the CERCLA process.
8. The strontium-90 groundwater plume at 100-N Area will attenuate through radioactive decay and efforts will be made to reduce the flux of strontium-90 to the Columbia River.
- Continue implementing the 100-NR 01/02 Interim Action ROD for soils and groundwater. Focus on implementing a groundwater remedial alternative that is more effective and efficient than pump-and-treat systems for reducing the flux of strontium-90 to the Columbia River. Utilize established CERCLA processes to modify the ROD for groundwater decisions.

¹ This was not discussed at the workshops and will require additional public involvement during regulatory decision process.